

# **EXHIBIT 1**

## The Moiré Reducing Limitations Relied Upon by Honeywell to Obtain Allowance of the '371 Patent Claims

### CLAIM 1 OF THE '371 PATENT

A display apparatus comprising:

a light source;

a liquid crystal panel mounted adjacent to said light source for receiving light from said light source; and

first and second lens arrays, each having a plurality of individual lenslets, disposed between said light source and said liquid crystal panel for providing a predetermined variation with viewing angle of light transmission from said light source through said lens arrays and said liquid crystal panel;

**wherein said liquid crystal panel comprises a plurality of pixels arranged in rows and columns, and wherein the number of rows of pixels per unit height, or pitch, of the liquid crystal panel is a first value; the number of lenslets per unit height, or pitch, of said first lens array is a second value which is less than said first value; and the number of lenslets per unit height, or pitch, of said second lens array is a third value which is greater than said first value.**

### CLAIM 3 OF THE '371 PATENT

A display apparatus comprising:

a light source;

a liquid crystal panel mounted adjacent to said light source for receiving light from said light source; and

first and second lens arrays, each having a plurality of individual lenslets, disposed between said light source and said liquid crystal panel for providing a predetermined variation with viewing angle of light transmission from said light source through said lens arrays and said liquid crystal panel,

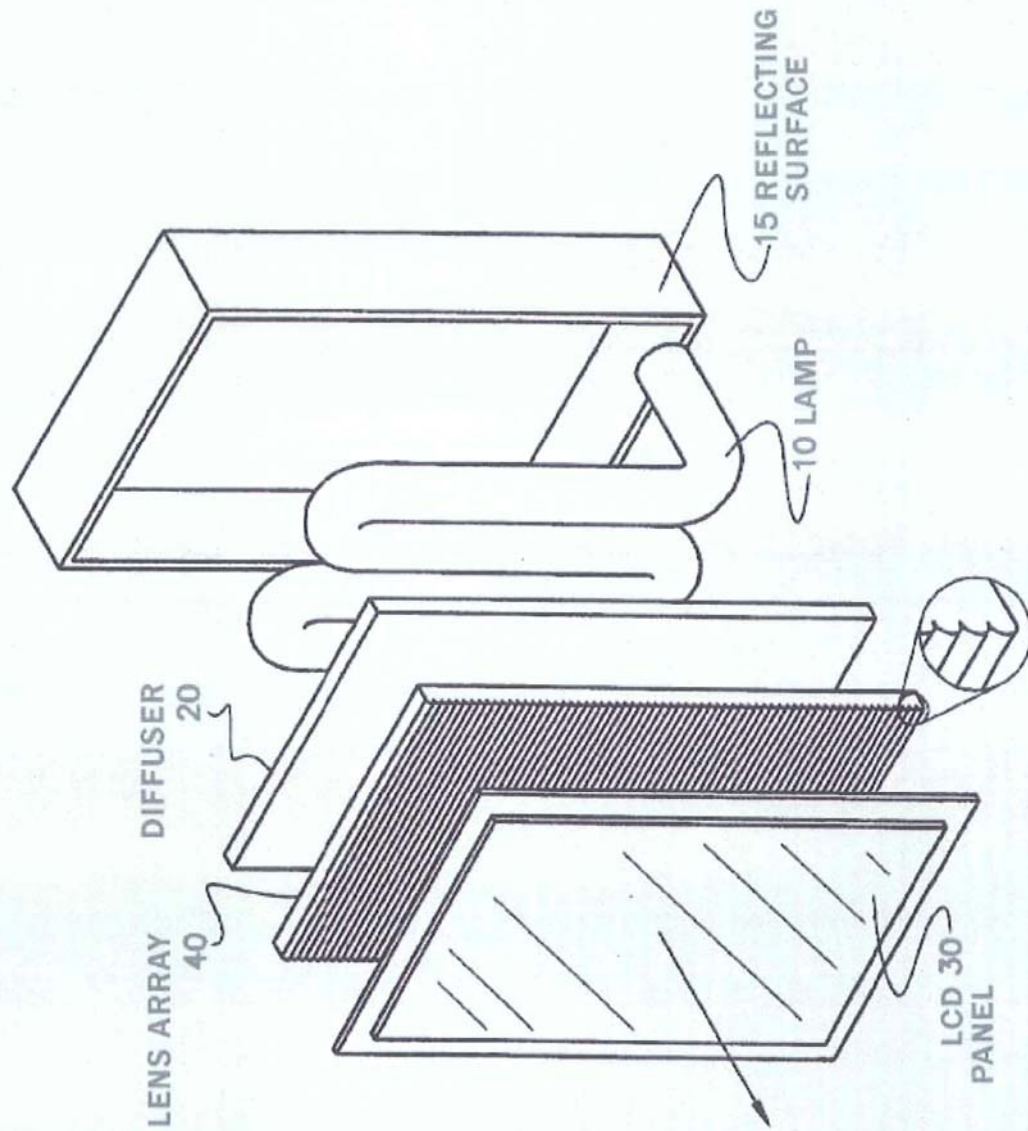
**wherein at least one of said first and second lens arrays is rotated about an axis perpendicular to said liquid crystal panel in order to provide a slight misalignment between said lenslets and said liquid crystal panel.**

# **EXHIBIT 2**

# Background

'371 PATENT, FIGURE 2 (ANNOTATED)

Liquid Crystal  
Display Module  
Elements



## Honeywell's '371 Patent Was NOT Important

→ **Honeywell never used** the '371 patent commercially.

*Honeywell's Answers dated April 12, 2007 to Samsung - SDI's 2nd set of Interrogatories in Gasser Opp. Decl. in Support of Def. Opp. Claim Construction Brief, Ex. 8*

→ **Boeing rejected** the technology in the Boeing 777 project, the origin of Honeywell's work regarding the '371 patent.

*Deposition Testimony of Richard McCartney, March 15, 2007 at Pages 345:10-348:2 in Tab A*

→ Honeywell admits it allowed the patent to **"lay dormant" for 10 years.**

*Deposition Testimony of David Brafman, Dec. 21, 2006 at Page 62 in Gasser Opp. Decl. in Support of Def. Opp. Claim Construction Brief, Ex. 14*

→ Honeywell's own expert's four surveys on backlighting technology in 1993-1997 **do not mention Honeywell, the '371 patent, or the Japan Display '92 article.**

*Gasser Opp. Decl. in Support of Def. Opp. Claim Construction Brief, Exs. 10-13*

JUNE 1990

Using Lens Arrays  
Located Between  
Backlight and  
LCD to Boost Light  
Gain Was Known



PRIOR ART: IBM TECHNICAL DISCLOSURE BULLETIN

→ In 1990, IBM had already disclosed the use of **lens arrays (Acrylic Sheet 4) to increase brightness** in LCD backlight systems:

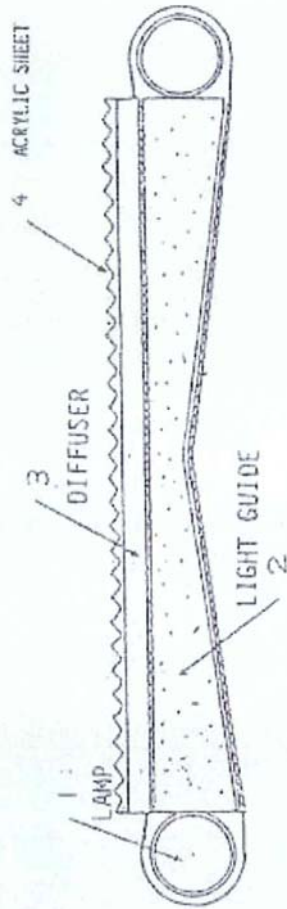


FIG. 1

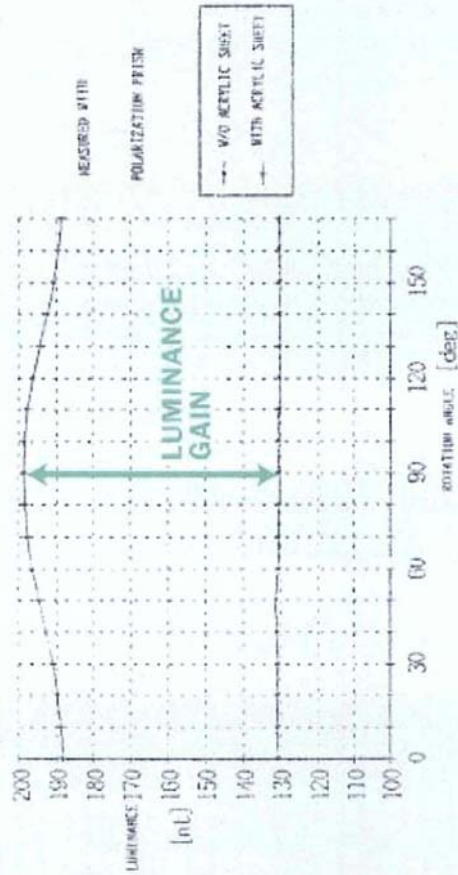


FIG. 2

Source: Schlam Decl. in Support of Def. Opening Claim Construction Brief, Ex. 3 at Pages 143-144

FEBRUARY 1991

Using Lens Arrays Located Between Backlight and LCD to Boost Light Gain Was Known



PRIOR ART: IBM TECHNICAL DISCLOSURE BULLETIN

→ In 1991, IBM had already disclosed **the use of lens arrays (micro prism plate):**

- **To increase brightness** within the LCD panel.
- **To achieve low power consumption** in portable LCD modules.

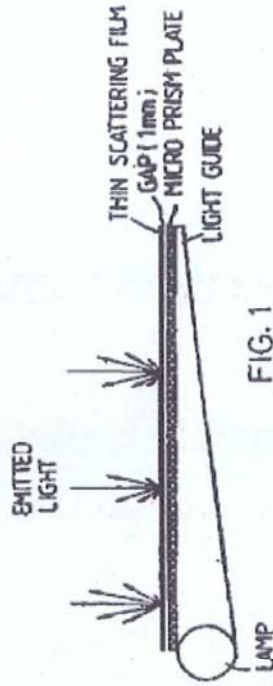


FIG. 1

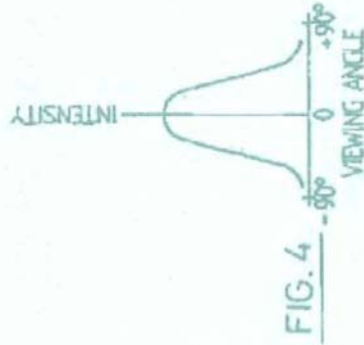


FIG. 4

“With this technique, **emitted light from the back light system has strong intensity distribution** to the normal direction to the back light surface as shown in Fig. 4.

Liquid crystal display's application is mostly portable area.... Therefore, the technique disclosed herein is a very effective means to **achieve a low power consumption LCD module.**”

Source: Gasser Decl. in Support of Def. Opening Claim Construction Brief, Ex. 2 at Page 262

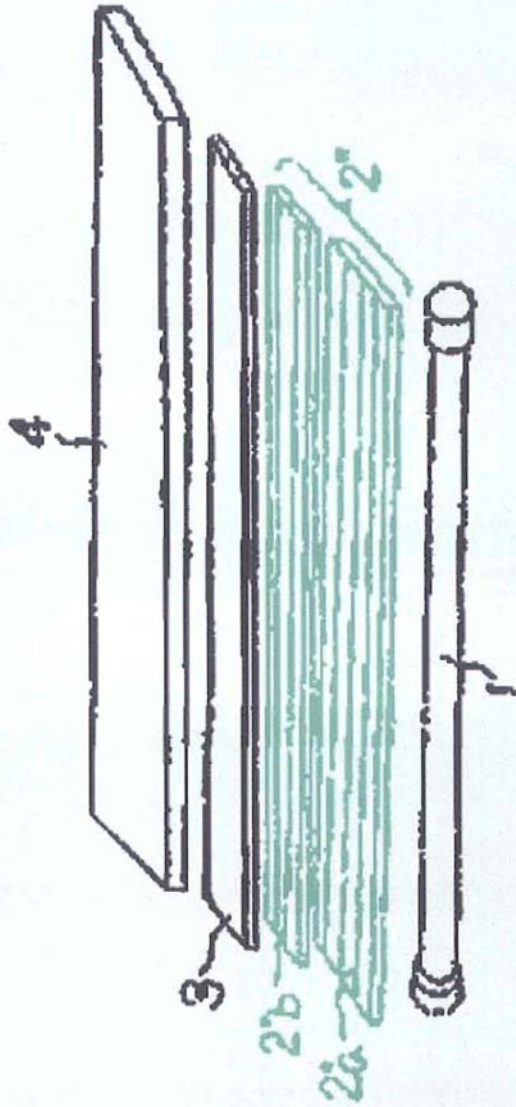
JULY 26, 1983

Using Two Lens  
Arrays Located  
Between Backlight  
and LCD to  
Boost Light Gain  
Was Known



PRIOR ART: MATSUYAMA S58-109786, FIGURE 3

第3図

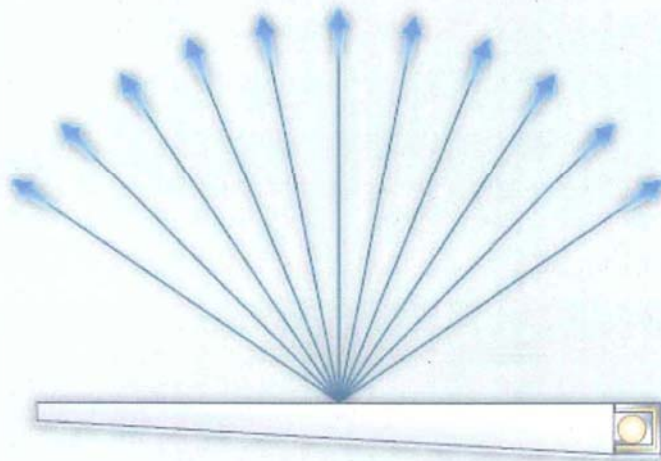


Source: Schlam Opp. Decl. in Support of Def. Opp. Claim Construction Brief, Ex. 15 at Page 865

## Brightness Enhancement Film (BEF)

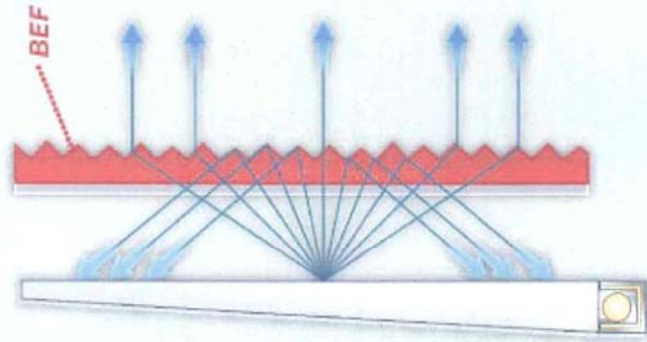
### Backlight **WITHOUT** Brightness Enhancement Film (BEF)

- Light exits LCD at angles outside the typical viewing range, much of it going to waste.

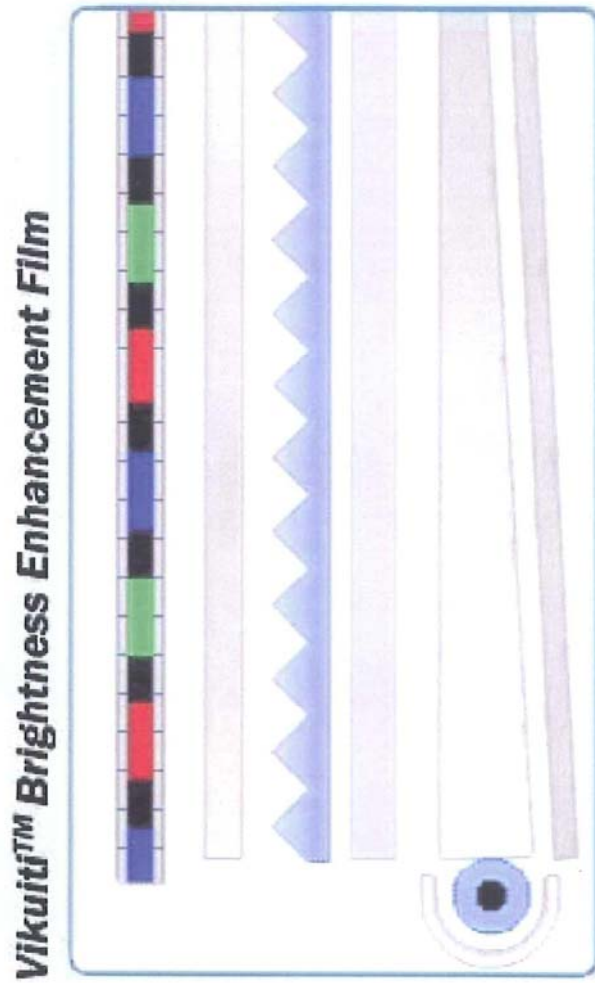


### Backlight **WITH** Brightness Enhancement Film (BEF)

- Light is focused within the typical viewing range, thus appearing brighter.

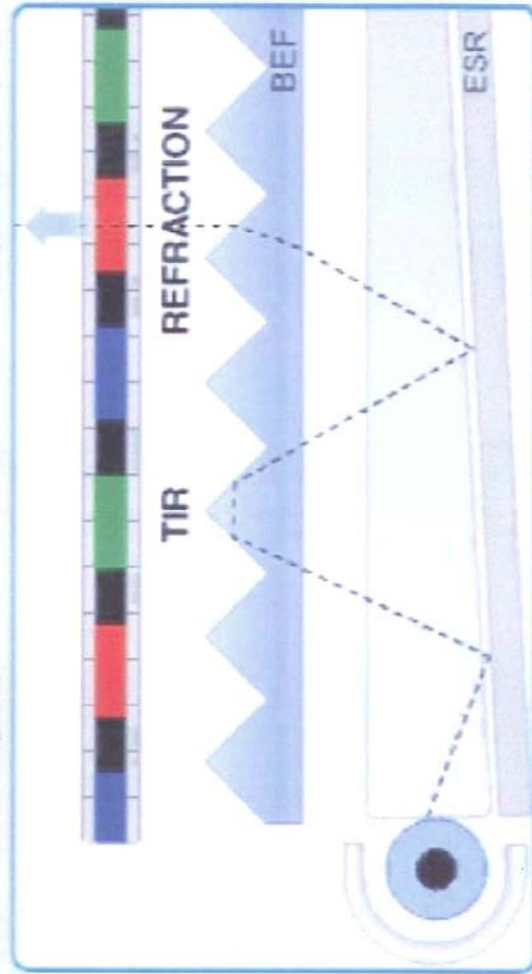


Vikuit™  
Brightness  
Enhancement Film



## Vikuiti™ Brightness Enhancement Film

### Vikuiti™ Brightness Enhancement Film



- Vikuiti™ BEF manages distribution of angular light
- Optimizes on-axis display brightness
- Compatible with all backlight designs

Source: [http://solutions.3m.com/wps/portal/3M/en\\_US/Vikuiti1/BrandProducts/secondary/vikuititutorials/prismfilmstutorial/](http://solutions.3m.com/wps/portal/3M/en_US/Vikuiti1/BrandProducts/secondary/vikuititutorials/prismfilmstutorial/)

# **The Cause of and Solutions to Moiré Interference Were Known Prior to the '371 Patent**

MAY 1963

The Cause of  
and Solutions to  
Moiré Interference  
Were Known Prior  
to the '371 Patent

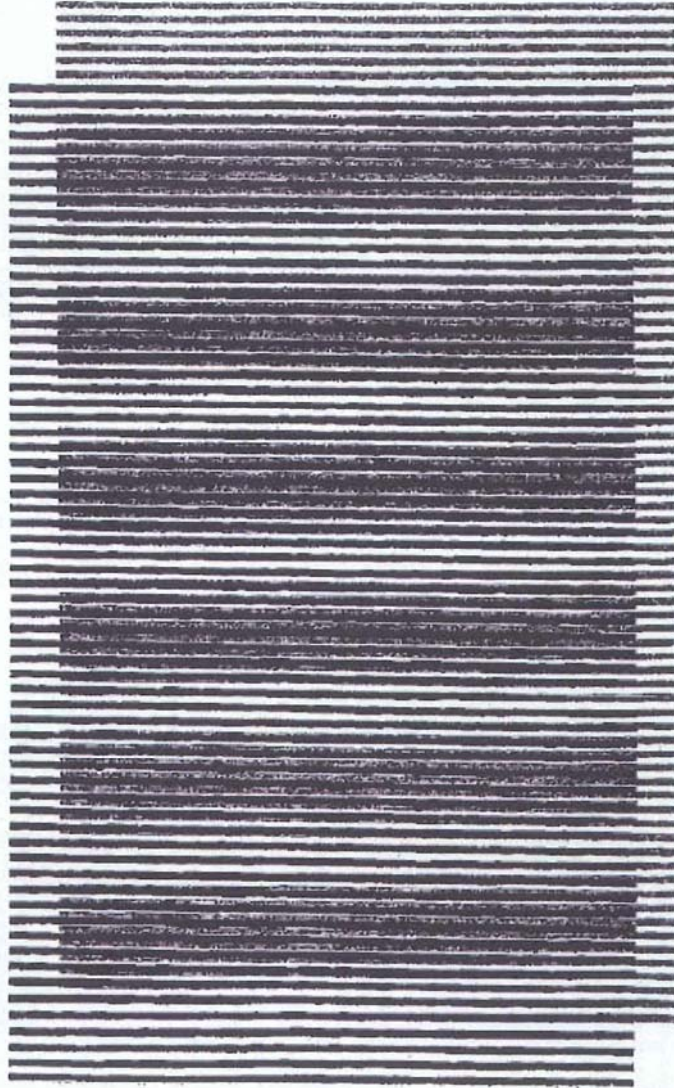


PRIOR ART: SCIENTIFIC AMERICAN, VOL. 208 NO. 5

## MOIRÉ PATTERNS

\* \* \* \* \*

... [T]hey are produced whenever two  
periodic structures are overlapped.



Source: Tab B at Pages 54-55

FEBRUARY 1991

Moiré and a  
Solution Were  
Known Where  
Lens Arrays  
Boosted Gain



PRIOR ART: IBM TECHNICAL DISCLOSURE BULLETIN

→ In 1991, IBM had already disclosed:

- The use of lens arrays **would create interference patterns** within the LCD panel.
- **The use of a diffuser** could break up the interference pattern.



FIG. 2

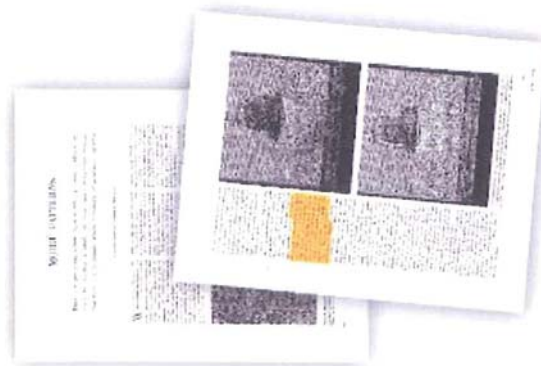
FIG. 1

**“The light scattering film is employed to eliminate interference pattern of the micro-prism-plate and LCD’s pixel arrangement pattern....”**

Source: Gasser Decl. in Support of Def. Opening Claim Construction Brief, Ex. 2 at Page 261

MAY 1963

Rotation Was a  
Known Solution  
to Moiré in Color  
Printing and  
Lithography



PRIOR ART: SCIENTIFIC AMERICAN, VOL. 208 NO. 5

It is not surprising that moiré patterns sometimes plague the printer whenever he is obliged to print two or more halftone impressions one atop the other, which he must do in making multicolored reproductions.

**To avoid moiré patterns the engraver's plates must be carefully positioned so that the dot patterns intersect at about 30 degrees.**

Source: Tab B at Page 63

MARCH 11, 1986

Rotation Was a  
Known Solution  
to Moiré in  
CRT Displays

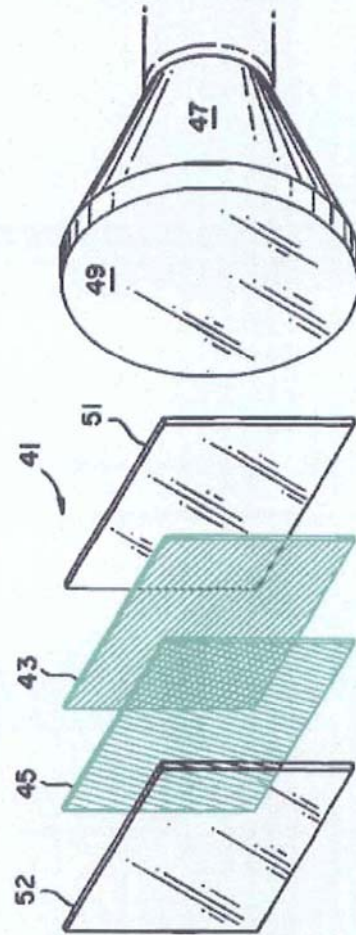


PRIOR ART: COHEN U.S. PATENT 4,575,767

## ABSTRACT

\* \* \* \* \*

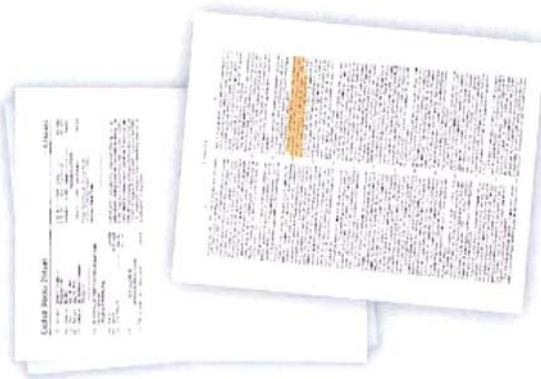
**In order to reduce moire patterns** which would result from varying coincidences of the planes with patterns of phosphor dots on the shadow mask CRT (47), **filter sheets (43,45) containing the light absorbing planes are rotated so that at least one set of light absorbing planes is misaligned with a set of closely-adjacent phosphor dots by approximately 15°.**



Source: Tab C

MAY 25, 1971

Rotation Was a  
Known Solution to  
Moiré in Projection  
Screen Displays



PRIOR ART: COOPER U.S. PATENT 3,580,661

**It has been experienced that the occurrence of observable moiré patterns can be further decreased by providing a slight rotational displacement (in opposite directions) of the two generally vertical cylindrical Fresnel lenses 30, 44.**

Source: Tab D at Col. 4:19-22

AUGUST 24, 1990

Rotation Was a  
Known Solution to  
Moiré in Projection  
Screen Displays

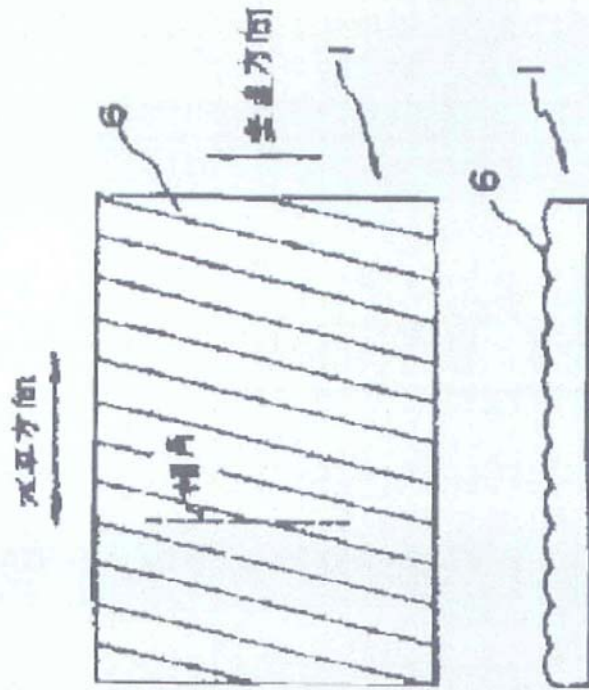


PRIOR ART: KAWASAKI PUBLISHED PATENT APPLICATION H2-212880

The inventors have...found that when the lenticular lens of the **transmission type screen is arranged at a specific inclination**, it is possible to provide a high-performance transmission type display device **without generating Moire fringes....**

That is, the present invention provides...that the transmission type screen has a **lenticular lens with an inclination of 5 to 45°** in the perpendicular direction....

Translation Pg. 744

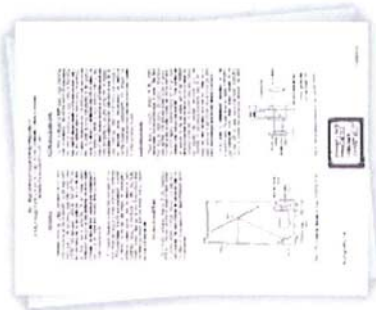


Source: Tab E

## Pitch Change Was a Known Solution to Moiré in Liquid Crystal Projection TV Displays

1989

PRIOR ART: NODA ARTICLE IN JAPAN DISPLAY '89



→ Noda et al. recognized moiré can arise due to “**interference between the dot pattern of the projected image and the parallel line structure of the lenticular plate**” and teaches ratios of 1.5, 2.5, 3.5 and 4.5.

Source: Tab F at Page 257; Figure 5

JANUARY 18, 1994

'371 PATENT, COL. 4:68-COL. 5:5



→ “According to these guidelines the fine array frequency becomes approximately **2.5** times the display spatial frequency and the coarse array frequency should be approximately the fine array frequency divided by **3.5, 4.5, 5.5** or as required for the most convenient fabrication.”

Moiré Elimination  
Is Critical to the  
Claims of the  
'371 Patent

### '371 Patent Prosecution History:



Honeywell gave up one lens array.



Honeywell gave up two lens arrays  
without moiré solution.



Honeywell argued cited prior art did not  
teach pitch and rotation solutions to moiré.



Patent Examiner had no prior art  
addressing moiré and, therefore,  
allowed the claims.